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# **Uterine Fibroids and Pregnancy: A Review of the Challenges**

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## **Abstract**

Uterine fibroids are quite common in women of the reproductive age group and as such commonly encountered in pregnancy. Though majority of these cases are asymptomatic, some are prone to developing complications and may end up having adverse outcomes in pregnancy. Management of these women with uterine fibroids presents its own challenges, especially in low-resource setting as in sub-Saharan Africa, where the condition is rife. Adequate management of these women, be it pregnant or nonpregnant, improves their quality of life.

**Keywords:** uterine fibroids, pregnancy, challenges, low-resource setting

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## **1. Introduction**

Uterine leiomyomata, otherwise called uterine fibroids or leiomyomas, are the commonest tumors of the human body and basically affect women of reproductive age; occurring in 40–60% of women of this group by age 35 years [1]. It appears that ovarian steroids are responsible for the growth of uterine fibroids. Women of the reproductive age group are those, not unexpectedly, impacted mostly by the challenges of uterine fibroids and pregnancy. Uterine fibroids can make it difficult for a woman to get pregnant and is a known cause of infertility. Obstetric complications of co-existing uterine fibroids in pregnancy include miscarriages, preterm labor, antepartum hemorrhage, malpresentation, malposition, obstructed labor, postpartum hemorrhage, uterine inversion and puerperal sepsis [2, 3]. As a result of the uterine fibroids there is also an increase in operative deliveries [2]. These complications can individually, or in combination, lead to maternal mortality if not properly managed.

Pregnancy itself has wide ranging impacts on uterine fibroids, and these include an increase in the size of the fibroids in 20–30% of cases, torsion of the uterine fibroids if pedunculated, infection, red degeneration, expulsion (if pedunculated and submucous) and necrosis [2, 4–6]. These generally impact negatively on the pregnant woman, leading to increased morbidity, and sometimes hospitalization [3]. This leads to increase in medications and the possible effects of these drugs on the pregnant woman and the developing fetus could be adverse.

A common clinical feature of uterine fibroids is menorrhagia, which could lead to anemia. If a woman with uterine fibroids and anemia becomes pregnant, the further impact of anemia in pregnancy could be deleterious to the woman and the unborn child. However, some uterine fibroids do cause polycythemia because of the elaboration of erythropoietin [7].

The focus of this chapter is with respect to the challenges of uterine fibroids in pregnancy; with the peculiar problems associated with a low-resource setting, sub-Saharan Africa to be specific. Uterine fibroids are rife in Blacks compared to other races, and so are quite common in sub-Saharan Africa.

## 2. Challenges of management

Risk factors for uterine fibroids include age, nulliparity, family history, early menarche, diabetes mellitus, hypertension and obesity [3, 8–10]. All these factors are quite prevalent in sub-Saharan Africa. With the high fertility rate and population growth, the population of women in the reproductive age group is on the increase. Improved nutrition, sophistication, education, and pursuit of careers have inevitably led to early menarche and delayed child-bearing, thus increasing the likelihood of developing uterine fibroids. Being a Black woman generally means because of the hereditary factors uterine fibroids are more likely to develop. Increased intake of western diet has also led to an increase in obesity (which increases peripheral conversion of androgens to estrogens by fat aromatization), diabetes mellitus and hypertension, and their attendant consequences, including an increase in the risk to developing uterine fibroids. Some studies have refuted any association between obesity and uterine fibroids [11].

The challenges of a low-resource setting are profound, and these range from poor health-seeking behavior, low socio-economic status, illiteracy, ignorance, dearth of health professionals (including brain drain of health professionals), adulterated/fake medicines, litany of quacks in the health sector and faith-based homes extending their reach to providing unskilled care, over-bearing reach of traditional birth attendants (TBAs) and traditional medicine practitioners, run-down health infrastructure with respect to public health facilities (inclusive of blood bank services), to general fear for surgical interventions amongst the populace (especially the illiterate and ignorant); inclusive of procedures like abdominal myomectomy and cesarean section. In addition, there is rejection of hysterectomy by lots of patients, including the well educated, because of the need to preserve fertility.

Because of the highlighted problems, there is a tendency of late presentation of patients with uterine fibroids in sub-Saharan Africa. As a result the fibroids are often large at presentation, usually above 12 weeks gestational age, and the patients having anemia for those presenting

with menorrhagia, or having fertility issues. Quite a number of such women have presented elsewhere for care, and have used all sorts of medications before presenting. A few have been given herbal concoctions to drink or insert vaginally as pessary, with the aim of shrinking or “dissolving” the uterine fibroids [12]. Some have, as a result, developed complications like renal failure as a result of medications they drank, or surgical complications like acquired gynatresia (vaginal stenosis) as a result of corrosive herbs applied vaginally, resulting in coital difficulties and problems at vaginal delivery when they become pregnant as a result of dystocia from soft tissue factors [12, 13]. Some patients have had multiple traditional surgical incisions carried out on their abdominal walls with the aim of letting out “bad blood”, and believing the fibroids will melt away; a medieval thinking. These incisions most times are carried out with unsterilized blades and carry an additional risk of spread of infections like viral hepatitis and HIV/AIDS, which become secondary issues later when these women become pregnant, I have as well come across patients who have tried urine therapy and more bizarre and unbelievable forms of therapy that may be considered as taboos to some people. Traditional healers are still well patronized [14].

The over-bearing influence of the clergy on health matters in sub-Saharan Africa cannot be over-emphasized. Faith-based healing homes are strewn across the communities and some clerics are known to advise patients against seeking care in hospitals or undergo surgery, but rather encouraged to await their miraculous healing. This is further encouraged by terrestrial and cable television evangelical healing programs that are often aired and widely viewed, and these days via radio stations, the print and social media. Some patients, as a result of their low socio-economic status, are unable to seek care in hospitals. As a result they present late and are probably only able to come to the hospital after financial help is gotten from family members, friends, neighbors, faith-based organizations and non governmental organizations when their plight has become very obvious and their conditions dire, with the uterine fibroids having become very large. Health insurance is in its infancy in most sub-Saharan African countries. Faith-based organizations can be an asset to the health profession if their efforts are properly channeled [15].

Despite the late presentation, most of these women, when they finally accept surgery and have been able to raise the money for the surgery seek to have abdominal myomectomy despite counseling and despite the risk associated with such a surgery instead of opting for the less risky hysterectomy because of their desire to conserve their reproductive potential [16, 17]. Extensive abdominal myomectomy is associated with prolonged anesthesia and surgery times, increased risk of hemorrhage, sepsis, thromboembolism, uterine synechia, intra-peritoneal adhesions and intestinal obstruction [3, 18–20]. Large uterine fibroids are a known cause of deep venous thrombosis from their pressure effect and the potential risks need to be managed. There is a potential risk as well of uterine necrosis during extensive myomectomy because of devascularization of parts of the uterus from the multiple incisions made on the uterus, especially if they were transverse. There is also the added risk in subsequent pregnancy of uterine rupture antenatally or intrapartum, most especially with breach of the endometrium and entry into its cavity during myomectomy [3]. Cases of utero-cutaneous and enterouterine fistulae, cervical stenosis with hematometra and pyometra have been reported following abdominal myomectomy [21, 22]. Recurrence of uterine fibroids, especially where fertility concerns still persist, has necessitated repeat myomectomies and further multiplying the possible complications [3].

Assisted reproductive technology availability and increased successes recorded in vitro fertilization (IVF) and intracytoplasmic sperm injection (ICSI) has also emboldened these women to insist on having uterine conserving myomectomy. These reproductive centers are more readily accessible even though majority of the women, because of their low socio-economic status, cannot afford the services provided.

Another surgical option now more readily accessed by women of higher socio-economic class is laparoscopic myomectomy. But despite being properly counseled on the recommendations for use of the laparoscopic method, especially with respect to the size of the uterine fibroids, some patients despite having huge uterine fibroids are willing to risk undergoing laparoscopic procedures solely because of the cosmetic appeal. It must be stressed that proper patient selection and surgeon's expertise play fundamental roles in the successful outcome of the laparoscopic procedure. Concerns of power morcellation of uterine fibroids during laparoscopic myomectomy, as to the risk of missing the diagnosis and disseminating leiomyosarcoma, are often secondary in low-resource sub-Saharan African setting because the procedure is not widely used in most of the countries.

Uterine artery embolization and high intensity focused ultrasound (HIFU) treatment options for uterine fibroids, which probably would have been popular in societies like ours where there is reluctance to undergo major surgery and blood bank services are suboptimal, are often not available as they require expensive equipment and specialist manpower. Reports of successful pregnancies following these treatment options have been reported.

### **3. Uterine fibroids and fertility concerns**

Several countries in sub-Saharan Africa have high prevalence rates of infertility. Community-based studies in Nigeria have reported infertility rates as high as 20% and 45% [23, 24]. Infertility in Africa is often stigmatized because of the high premium placed on child-bearing and the infertile couple (often the female partner) is abused and ostracized from the society. A World Health Organization (WHO) study showed a much higher rate of infertility in Africa being infection-related compared to other regions of the world [25]. These infections are often sexually transmitted, post-abortal and puerperal infections.

Uterine fibroids are commonly diagnosed in women being investigated for infertility in sub-Saharan Africa [26]. It is said that the relationship between uterine fibroids and infertility is either casual or causal, as it is often difficult to ascertain the independent contribution of fibroids to infertility, since uterine fibroids are also found commonly in fertile and pregnant women [26]. Uterine fibroids tend to cause infertility by distortion and elongation of the uterine cavity and impaired uterine contractility leading to difficult sperm ascent, congestion of the endometrium leading to defective implantation, cornual occlusion and stretching of the Fallopian tube over a large uterine fibroid [3, 26]. Because of likely co-morbid manifestation of uterine fibroids and pelvic inflammatory disease (PID), which is not unusual in sub-Saharan Africa, infertility may result from extensive peritubal adhesions and interference with ovulation and ovum pick-up. Submucous uterine fibroids are those that are likely to lead to infertility.

## 4. Uterine fibroids and pregnancy

Women with uterine fibroids in pregnancy generally have concerns, with fear of adverse outcome. However, these women generally have uneventful outcomes in pregnancy. Several studies have reported inconsistent relationships between uterine fibroids and adverse obstetric outcomes [2].

Uterine fibroids, especially multiple, intramural or submucous, are associated with increased risk of early pregnancy loss when compared with control subjects (14% vs. 7.6%) [27, 28]. Spontaneous miscarriage is more likely to occur in women with fibroids located in the corpus (body) than in the lower uterine segment [29]. Suggested events that lead to increased pregnancy loss when there is co-existing uterine fibroid include increase in uterine irritability and contractility, the compressive effect of fibroids, and the compromise of blood supply to the developing placenta and fetus [30].

The risk of threatened miscarriage, as reflected by painless vaginal bleeding early in pregnancy, is also increased when uterine fibroids are associated with pregnancy. The likelihood of this happening is dependent on the location of the uterine fibroids, and is more when the placenta implants close to a fibroid nodule [31].

For those women that end up having a miscarriage there is an added burden on the care giver when the end result is an incomplete or a missed miscarriage, especially when there is a huge cervical or lower uterine segment fibroid nodule which may obstruct access into the uterine cavity to carry out an evacuation of the uterus. The use of flexible plastic cannulae has in some ways overcome this hurdle; but some patients do end up having a hysterotomy for uterine evacuation [32]. When uterine evacuation in mid trimester pregnancy loss fails there is the potential for retained fetal bone as a result of distorted uterine anatomy caused by the fibroids. A septic miscarriage carries the potential risk of a pyomyomata formation [33].

Incarceration of a gravid uterus co-existing with uterine fibroids in the mid trimester can occur in the pelvis and happens if the uterus is trapped by the sacral promontory, usually if retroverted or as a result of the fibroid nodule [34]. The symptoms are usually vague but often reflect discomfort within the pelvis.

Studies have shown that in late pregnancy women with uterine fibroids tend to have a higher risk of preterm labor and preterm delivery when compared with women without uterine fibroids (16.1% vs. 8.7% and 16% vs. 10.8% respectively) [35]. It should be noted that uterine fibroids do not appear to increase the risk of preterm premature rupture of membranes, though some studies have contrary results [36].

Preterm labor and preterm delivery risks tend to increase the use of antenatal corticosteroids for fetal lung maturity, and use of tocolytic medications for suppression of preterm labor. Where facilities are available procedures like amniocentesis for fetal lung maturity testing may need to be carried out prior to delivery of the baby if pregnancy is less than 34 weeks. The problems of prematurity for the baby and need for neonatal intensive care unit hospitalization brings its added strain on resources in resource-challenged settings.

Placental abnormalities may also arise in pregnancy when uterine fibroids co-exist. Studies have suggested a 3-fold increase in cases of abruption placentae in pregnant women with uterine fibroids, especially if the fibroid nodules are submucous, retroplacental or have a volume greater than 200 cm<sup>3</sup> [29, 35]. There is a 2-fold increase in the risk of having placenta praevia in pregnant women with uterine fibroids [35, 37]. The added risk of morbid adherence of the placenta should be borne in mind in these patients with placenta praevia, especially if they have had a previous cesarean section or previous myomectomy, which are independent risk factors for placenta praevia. The presence of placenta praevia increases the possibility of surgical intervention, and this further impacts on the lean resources in low-resource settings.

Uterine fibroids in pregnancy do not appear to restrict fetal growth; however large fibroids as a result of compression could lead to fetal deformities like dolichocephaly, torticollis and limb reduction defects [2, 38–40].

## 5. Labor, delivery and puerperium

Fetal malpresentations and malpositions tend to make labor and delivery more difficult and increase the risk of complications for the mother and the baby, with increased risk of operative interventions (cesarean section). Large fibroids, multiple fibroids and fibroids in the lower uterine segment are independent risk factors for malpresentation [29, 37, 41].

Labor dystocia is increased 2-fold in pregnant women with uterine fibroids [35, 42]. On some occasions large fibroids in the lower uterine segment or subserous and pedunculated get impacted in the pelvis and have been mistaken for the fetal head during labor, and may lead to unfavorable fetal outcome in the hands of the inexperienced accoucheur/midwife [32].

Complications of the third stage of labor and puerperal complications tend to be more in women with uterine fibroids. Retained placenta occurs more commonly in women with uterine fibroids [29, 35]. Because of the interference with myometrial contractility, women with uterine fibroids during labor tend to have dysfunctional labors, and as a result are more likely to have oxytocic use to co-ordinate the uterine contractions to ensure the labor progresses in the right manner. This effect on myometrial contractility repeats itself after the baby and placenta are delivered leading to uterine atony, which results in post partum hemorrhage [35]. As a result interventional means like oxytocics use, manual removal of the placenta, procedures for combating post partum hemorrhage (inclusive of puerperal hysterectomy) and antibiotics use peripartum tend to be higher in parturients with uterine fibroids [32, 35].

Post myomectomy (abdominal and laparoscopic) women in labor present peculiar problems as well, most especially the possibility of intrapartum uterine rupture [43]. This risk of uterine rupture is much less when the uterine cavity is not breached during myomectomy. They also run the risk of having morbid placental adherence [44].

## 6. Drug exposure in pregnant women with uterine fibroids

The management of pregnant women with uterine fibroids antenatally is usually not different from those without uterine fibroids. However when complications arise they are managed accordingly. A common complaint they have is fibroid pain as a result of red degeneration, and this is usually managed conservatively by bed rest, hydration and analgesic use. Non steroidal anti-inflammatory drugs (prostaglandin synthetase inhibitors) should be used with caution, especially in the third trimester because of the potential for fetal and neonatal adverse effects, including premature closure of fetal ductus arteriosus, pulmonary hypertension, necrotizing enterocolitis, intracranial hemorrhage and oligohydramnios [45]. Additional pain management, especially opioid use, and on few occasions epidural analgesia and surgical management antenatally (myomectomy), may be employed when pain is intense [46, 47].

The use of antenatal corticosteroids and tocolytics for management of preterm labor in pregnant women with uterine fibroids was earlier highlighted in this chapter.

## 7. Surgery in pregnant women with uterine fibroids

The commonest surgery carried out in pregnant women with uterine fibroids is cesarean section. This is often indicated if the fibroid is large and located in the lower uterine segment where it is likely to cause malpresentation of the fetus or cause obstructed labor. It is generally advised that myomectomy should be avoided as much as possible during cesarean section because of the substantiated risk of significant hemorrhage. However, reports abound of successful myomectomies during cesarean section [48–50]. Myomectomies antenatally by laparotomic or laparoscopic approach prior to fetal viability, most especially in the second trimester of pregnancy, have been rarely carried out as a result of intractable pain from a degenerating fibroid; especially if subserosal and pedunculated, large or rapidly growing, or large fibroid (>5 cm) located in the lower uterine segment [2, 47, 51]. Women having myomectomy antenatally are more likely to be delivered by cesarean section due to increased risk of intrapartum uterine rupture, though some have successfully delivered vaginally [51–54]. There is an additional risk of infections, which may lead to intramural uterine abscess formation (a rare clinical entity), as well as the loss of the pregnancy prior to fetal viability or preterm labor [55].

Furthermore, incidental myomectomies have been carried out during surgery for ectopic gestation, be it unruptured or ruptured ectopic gestation [56]. The probity of carrying out such incidental surgeries has been questioned [57].

An unusual presentation of fibroids is disseminated leiomyomatosis peritonei, and this has occasionally necessitated surgical intervention antenatally as a result of pain [58]. Making a diagnosis has often been a conundrum, often only suspected at surgery and confirmed following histopathologic analysis of a biopsy specimen. It is occasionally encountered incidentally during cesarean section for unrelated obstetric indications.

Other surgeries related to uterine fibroids and pregnancies are uterine artery embolization, uterine artery ligation and hysterectomy during cesarean section or puerperally as a result of post partum hemorrhage. Bilateral uterine artery embolization has been performed by interventional radiologists to control post partum hemorrhage, and if performed immediately after cesarean section in women with uterine fibroids may decrease post partum blood loss and reduce the risk of a later myomectomy or hysterectomy by shrinking the fibroids. Bilateral uterine artery ligation at cesarean section achieves similar results [59]. Successful pregnancy outcome after uterine artery embolization for uterine fibroids has been reported [60].

## 8. Conclusion

Uterine fibroids are generally asymptomatic even when co-existing with pregnancy. Most pregnant women with uterine fibroids have uneventful outcomes.

The fears of these women with uterine fibroids in pregnancy are founded when looking at the well-substantiated risks. There is the need for training of healthcare professionals (especially in resource-challenged settings) and providing standard health infrastructure/equipment to properly manage uterine fibroids in pregnant and non pregnant women. These would generally improve their health and quality of life, and minimize the various health risks to which they are exposed.

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